

Listing of the Claims:

This listing of claims will replace all prior versions, and listing of claims in the application:

1. (Currently Amended) In a Java computing environment, a Java macro virtual machine loop instruction for execution by a virtual machine,

wherein said macro virtual machine loop instruction represents a conventional sequence of Java Bytecode instructions in a Java-programming loop that can be executed by said virtual machine, said conventional sequence of Bytecode instructions including a conventional conditional flow control Bytecode;

wherein said Java macro instruction is a single virtual machine instruction that can effectively replace said conventional sequence of Bytecode instructions and can be executed by a Java said virtual machine operating in said Java computing environment, and

wherein[[,]] when said Java macro instruction is executed, the operations that are performed by said conventional sequence of Java Bytecode instructions are performed; and

wherein said macro virtual machine loop instruction is generated and loaded into said virtual machine instead of said conventional sequence of Bytecode instructions during the Bytecode verification prior to execution time.

2. (Cancelled)

3. (Cancelled)

4. (Currently Amended) A Java-macro instruction as recited in claim 1, wherein said Java-virtual machine internally represents Java instructions as a pair of streams.

- 5. (Currently Amended)** A Java macro instruction as recited in claim 4,
wherein said pair of streams includes a code stream and a data stream,
wherein said code stream is suitable for containing a code portion of said Java
macro instruction, and
wherein said data stream is suitable for containing a data portion of said Java
macro instruction.
- 6. (Currently Amended)** A Java macro instruction as recited in claim 5,
wherein said Java-macro instruction is generated only when said virtual machine
determines that said Java macro instruction should replace said sequence.
- 7. (Original)** A Java macro instruction as recited in claim 6, wherein said determination
is made based on a predetermined criteria.
- 8. (Currently Amended)** A Java macro instruction as recited in claim 7, wherein said
predetermined criteria is whether said sequence has been repeated more than a
predetermined number of times.
- 9. (Currently Amended)** A macro virtual machine loop instruction as recited in
claim 1, In a Java computing environment, a Java macro instruction representing:
~~a sequence of Java Bytecode instructions in a Java programming loop,~~
wherein said sequence of Java virtual machine loop instruction is Bytecode
instructions are in a reduced set of virtual machine instructions suitable for execution in
a virtual machine, the reduced set of virtual machine instructions representing a full set
of conventional ~~a number of corresponding~~ Java Bytecode executable instructions that
are also suitable for execution in the virtual machine,

wherein the reduced set of the virtual machine instructions consists of a number of virtual machine instructions which is less than the number of instructions in the full set of conventional the corresponding Java Bytecode executable instructions, and

wherein every one of the corresponding Java instructions in the full set of conventional Bytecode executable instructions can be represented by at least one of the virtual machine instructions in the virtual machine instruction set.

10-20 (Cancelled)

21. (New) A method for executing a programming loop by a virtual machine, said method comprising:

receiving during Bytecode verification at load time a plurality of conventional Bytecodes instructions which can be executed by said virtual machine;

determining during Bytecode verification at load time whether said plurality of conventional Bytecodes instructions includes a predetermined first sequence of Bytecode instructions that performs a programming loop, wherein said first sequence includes a conventional conditional flow control Bytecode;

generating at load time a single macro virtual machine loop instruction that can effectively replace said first sequence of Bytecode instructions when said determining determines that said plurality of conventional Bytecodes instructions includes said first sequence of Bytecode instructions that performs a programming loop;

loading at load time said single macro virtual machine loop instruction into said virtual machine instead of said first sequence of Bytecode instructions; and

executing at runtime said single macro virtual machine loop instruction by said virtual machine, thereby allowing said first sequence of Bytecode instructions to be performed by said macro virtual machine loop instruction to perform said programming loop.

22. (New) A method as recited in claim 21, wherein said virtual machine internally represents instructions as a pair of streams.

23. (New) A method as recited in claim 22, wherein said pair of streams includes a code stream and a data stream,

wherein said code stream is suitable for containing a code portion of said macro instruction, and

wherein said data stream is suitable for containing a data portion of said macro instruction.

24. (New) A method as recited in claim 21, wherein said macro virtual machine loop instruction is generated only when said virtual machine determines that said first sequence has been repeated more than a predetermined number of times.

25. (New) A virtual machine for executing instructions that include a programming loop, wherein said virtual machine is capable of:

receiving during Bytecode verification at load time a plurality of conventional Bytecodes instructions which can be executed by said virtual machine;

determining during Bytecode verification at load time whether said plurality of conventional Bytecodes instructions includes a predetermined first sequence of Bytecode instructions that performs a programming loop, wherein said first sequence includes a conventional conditional flow control Bytecode;

generating at load time a single macro virtual machine loop instruction that can effectively replace said first sequence of Bytecode instructions when said determining determines that said plurality of conventional Bytecodes instructions includes said first sequence of Bytecode instructions that performs a programming loop;

loading at load time said single macro virtual machine loop instruction into said virtual machine instead of said first sequence of Bytecode instructions; and

executing at runtime said single macro virtual machine loop instruction by said virtual machine, thereby allowing said first sequence of Bytecode instructions to be performed by said macro virtual machine loop instruction to perform said programming loop.

26. (New) A virtual machine as recited in claim 25, wherein said virtual machine internally represents instructions as a pair of streams.
27. (New) A virtual machine as recited in claim 26, wherein said pair of streams includes a code stream and a data stream,
wherein said code stream is suitable for containing a code portion of said macro instruction, and
wherein said data stream is suitable for containing a data portion of said macro instruction.
28. (New) A virtual machine as recited in claim 25, wherein said macro virtual machine loop instruction is generated only when said virtual machine determines that said sequence has been repeated more than a predetermined number of times.